What is claimed is:

1. A downlink beam frame scheduler comprising:

a memory; and

a schedule table stored in the memory, the schedule table comprising:

a scheduling segment comprising at least one scheduling entry, the scheduling entry comprising a header field defining at least one of a payload and frame type for at least one of a payload and frame to be transmitted, and payload data pointers to data in memory to be transmitted in the payload.

2. The frame scheduler of claim 1, wherein the header field defines a payload type indicative of coding rate for the payload.

3. The frame scheduler of claim 1, wherein the scheduling entry comprises a first payload scheduling entry for the payload in the frame, and wherein the

scheduling table further comprises a second payload scheduling entry for a second payload in the frame.

4. The frame scheduler of claim 1, wherein the header field defines a first payload type field for a first payload in the frame and a second payload type field for a second payload in the frame.

5. The frame scheduler of claim 1, wherein the payload data pointers comprise queue pointers.

6. The frame scheduler of claim 5, wherein the queue pointers are indicative of downlink beam hop location.

7. The frame scheduler of claim 6, wherein the queue pointers are further indicative of priority.

8. The frame scheduler of claim 7, wherein the queue pointers are further indicative of code rate.

9. The frame scheduler of claim 8, wherein the code rate is one of a light and heavy code rate.

10. The frame scheduler of claim 1, wherein the memory comprises a plurality of scheduling segments for directing preparation of downlink frames.

11. The frame scheduler of claim 1, wherein the payload header further defines a frame offset pointing to a subsequent payload header.

12. The frame scheduler of claim 1, wherein the header field defines a power gated payload type.

13. The frame scheduler of claim 1, wherein the header field defines a power gated frame type.

14. The frame scheduler of claim 1, wherein the scheduling segment comprises a plurality of scheduling entries, each scheduling entry directing preparation of a subsequent downlink frame.

15. The frame scheduler of claim 1, wherein the data are ATM cells.

16. A downlink frame processing system for a satellite, the frame processing system comprising:

a packet switch routing self addressed uplink data from an input port to an output port;

a memory coupled to the output port, the memory comprising storage for at least two downlink beam hop locations; and

a downlink scheduler coupled to the memory, the downlink scheduler including a downlink schedule comprising at least one scheduling entry, the scheduling entry comprising a header field defining at least one of a payload and frame type for at least one of a payload and frame to be transmitted, and payload data pointers into the memory.

17. The frame processing system of claim 16, wherein the downlink scheduler comprises a plurality of scheduling segments, each including a downlink schedule.

18. The frame processing system of claim 17, wherein one of the scheduling segments in an active

scheduling segment, and the remaining segments are inactive scheduling segments.

19. The frame processing system of claim 16, wherein the uplink data are ATM cells.

20. The frame processing system of claim 16, wherein the header field defines a first payload type field for a first payload in the frame and a second payload type field for a second payload in the frame.

21. The frame processing system of claim 16, wherein the payload data pointers comprise queue pointers.

22. The frame processing system of claim 20, wherein the queue pointers are indicative of downlink beam hop location.

23. The frame scheduler of claim 22, wherein the queue pointers are further indicative of priority.

24. The frame scheduler of claim 23, wherein the queue pointers are further indicative of code rate.

25. The frame scheduler of claim 24, wherein the code rate is one of a light and heavy code rate.

26. A method for preparing downlink frames for transmission in a satellite downlink, the method comprising:

switching self addressed uplink data from a switch input port to a switch output port;

allocating, in a memory, storage for at least two downlink beam hop locations; and

forming downlink frames by processing a downlink schedule comprising at least one scheduling entry, a header field in the scheduling entry defining at least one of a payload and frame type for at least one of a payload and frame to be transmitted, and payload data pointers into the memory.

27. The method of claim 26, wherein allocating comprises allocating a first downlink beam hop location queue and a second downlink beam hop location queue.

28. The method of claim 27, wherein processing comprises processing an active one of a plurality of scheduling segments storing the downlink schedule.

29. The method of claim 28, further comprising deactivating the active one of the scheduling segments and activating a different scheduling segment in the plurality of scheduling segments.

30. The method of claim 26, wherein processing the payload data pointers comprises processing queue pointers.

31. The method of claim 30, wherein processing queue pointers comprises processing queue pointers indicative of downlink beam hop location.

32. The method of claim 31, wherein processing queue pointers comprises processing queue pointers indicative of priority.

33. The method of claim 32, wherein processing queue pointers comprises processing queue pointers indicative of code rate.

34. The method of claim 30, further comprising the step of servicing a different queue when a scheduled queue indicated by a queue pointer is empty.

35. The method of claim 33, further comprising the step of servicing a light coding queue when a heavy coding queue indicated by a queue pointer is empty.